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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/438,491	11/12/1999	TOSHIYUKI YOSHIHARA	684.2935	9399

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FITZPATRICK CELLA HARPER & SCINTO
30 ROCKEFELLER PLAZA
NEW YORK, NY 10112

EXAMINER

SCHWARTZ, JORDAN MARC

ART UNIT	PAPER NUMBER
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2873

DATE MAILED: 06/17/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application N .

09/438,491

Applicant(s)

YOSHIHARA, TOSHIYUKI

Examiner

Jordan M. Schwartz

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 01 April 2004.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 2-10, 12-17, 19 and 20 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 2-10 is/are allowed.
- 6) ☒ Claim(s) 12, 13, 16, 17, 19 and 20 is/are rejected.
- 7) ☒ Claim(s) 14 and 15 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 12-13, 17 and 19-20 are rejected under 35 U.S.C. 102(b) as being anticipated by Tsuji et al patent number 5,424,552.

Tsuji et al reads on these claims by disclosing the limitations therein including the following: a projection optical system for projecting a device pattern of a mask onto a substrate (column 5, line 45 to column 6, line 32, column 12, line 49 to column 13, line 24) comprising a projection optical system being disposed between the mask and the substrate (Figure 36, "PL"); an optical element for correcting aberration disposed between the mask and the substrate (Figure 36, element "340" and column 57, lines 29-59); the optical element having a refractive power in one direction of two orthogonal directions and no refracting power in the other of two orthogonal directions (column 57, line 50 re lens "340" as cylindrical); and the optical element disposed between the mask and the substrate (Figure 36). Tsuji et al further discloses this lens element as rotating (Figure 36, column 57, line 50). An optical axis can be described in terms of x,y, and z planes within which the optical axis lies. By rotating an optical element relative to an optical axis, the element will inherently be inclined relative to one of the planes of the optical axis and therefore will be "inclined with respect to an optical axis". Therefore, by

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rotating the element "340" of Tsuji et al, element "340" will be inclined with respect to one of the planes of the optical axis of the projection lens and therefore will be "inclined with respect to an optical axis of the projection lens". Specifically, if one considers the up and down direction of Figure 36 as the "y plane", then by rotating element "340", the element will be inclined at least relative z plane of the optical axis of the projection optical system and therefore will be "inclined with respect to an optical axis of the projection optical system". Tsuji et al further discloses a plurality of these optical elements (column 57, line 50 re "cylindrical lenses "340" ad "341") and the lenses used selectively to change the aberration (column 57, lines 50-59). It is believed that the optical element "340" will inherently have an optical power as claimed in claim 17, this being reasonably based upon Tsuji et al disclosing this lens to reduce aberrations. Tsuji et al further discloses an illumination system for illuminating the mask (column 6, line 3); and a method for transferring a device pattern onto a wafer (Figure 36 and column 5, line 46 to column 6, line 32).

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claim 16 rejected under 35 U.S.C. 103(a) as being unpatentable over Tsuji et al in view of Matsumoto et al.

Tsuji et al discloses as is set forth above including the lens for use in a projection exposure apparatus (abstract) and the projection exposure apparatus using an excimer laser as the light source (column 47, lines 47-58, column 11, line 26) but does not specifically disclose the lens composed of either quartz or fluorite. Matsumoto et al teaches that in a projection exposure apparatus using an excimer laser as a light source (paragraphs 0001 and 0005) that it is desirable to use lens elements of either or both quartz and fluorite in order to provide improved imaging with the use of an excimer laser of the patterned mask onto the substrate (paragraphs 0001 and 0005). Therefore, it would have been obvious to a person of ordinary skill in the art at the time the invention was made to have the projection exposure apparatus of Tsuji et al comprising either quartz or fluorite since Matsumoto et al teaches that in a projection exposure apparatus using an excimer laser as a light source, that it is desirable to use lens elements of either or both quartz and fluorite in order to provide improved imaging with the use of an excimer laser of the patterned mask onto the substrate.

Allowable Subject Matter

Claims 2-10 are allowed.

Claims 14-15 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

The following is a statement of reasons for the indication of allowable subject matter: with respect to the allowable subject matter, none of the prior art either alone or in combination disclose or teach of the claimed combination of limitations to warrant a

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rejection under 35 USC 102 or 103. Specifically, with reference to independent claim 2, none of the prior art either alone or in combination, disclose or teach of the claimed aberration changing optical system specifically including, as the distinguishing feature in combination with the other limitations, the claimed optical element as both rotatable about a rotational axis and tiltable relative to the optical axis and the optical element having different refracting powers in two orthogonal directions or having a refracting power in one of two orthogonal directions and no refracting power in the other of the two orthogonal directions. Specifically, with reference to claim 14, none of the prior art either alone or in combination, disclose or teach of the claimed projection system specifically including, as the distinguishing feature in combination with the other limitations, the claimed second optical element having the structure and positioning as claimed in claim 14. Specifically, with reference to claim 15, none of the prior art either alone or in combination, disclose or teach of the claimed projection system specifically including, as the distinguishing feature in combination with the other limitations, the claimed parallel flat plate being inclined with respect to the optical axis and being in an opposite direction to the claimed optical element.

Response to Arguments

Applicant's arguments filed April 1, 2004 have been considered but, with respect to the rejected claims set forth above, they are not persuasive.

Applicant argues that the optical axis of the cylindrical lens of Tsuji et al is registered with the optical axis of the projection lens and is not inclined in a manner of the present invention. However, while the lens of Tsuji et al may not be inclined in a

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manner of the present invention, it is "inclined with respect to an optical axis of the projection lens system" as stated in the rejection above. Specifically, in Tsuji et al, by virtue of being rotated, the lens is inclined in at least the z-direction of the optical axis i.e. in the direction from the front to the back of the lens (not side to side) and is therefore "inclined with respect to an optical axis of the projection optical system".

Conclusion

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jordan M. Schwartz whose telephone number is (571) 272-2337. The examiner can normally be reached on Monday to Friday (8:00-5:30), alternate Fridays off.

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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Georgia Y. Epps can be reached at (571) 272-2328. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



Jordan M. Schwartz
Primary Examiner
Art Unit 2873
June 15, 2004